

20 LED Light Chaser Ring

Contents:

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|-------------------------------------|-----------------------------|
| 1 Circuit board "LL20 v1.0" | 1 Resistor 180 Ω |
| 1 IC 74HC00 (quad NAND gate) | 2 Resistors 100 k Ω |
| 1 IC 74HC4017 (decimal counter) | 3 Resistors 330 k Ω |
| 1 14-pin IC socket | 2 Ceramic capacitors 50 pF |
| 1 16-pin IC socket | 2 Ceramic capacitors 100 nF |
| 20 LEDs 5mm yellow, high efficiency | 1 Battery Holder for CR2032 |
| 1 Slide switch | 1 Button cell CR2032 |

General Soldering Advice

Insert the components one at a time and bend the leads outward slightly to prevent the component from falling out. Heat up the solder joint for a second before feeding some solder wire between the soldering iron's tip, the board and the component's lead. Wait for a few more seconds before removing the tip from the solder joint so the solder has time to flow. Don't move the board before the solder has solidified. After soldering, trim the leads with a wire cutter to about 1-2 mm length.

See http://mightyohm.com/files/soldercomic/FullSolderComic_EN.pdf for more detailed instructions.

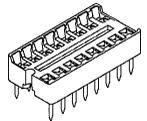
I recommended soldering the components in the order listed below. Make sure the board is the right side up (component outlines visible, see image) before starting.

1. Resistors (R1~R6): Bend the leads 90° as close to the resistor body as possible, then insert the resistors into the board and solder them, Orientation doesn't matter.

Resistor	Value	Colour Code
R1, R4	100 k Ω	brown, black, yellow, gold <i>or</i> brown, black, black, orange, brown
R2, R3, R5	330 k Ω	orange, orange, yellow, gold <i>or</i> orange, orange, black, orange, brown
R6	180 Ω	brown, grey, brown, gold <i>or</i> brown, grey, black, black, brown



2. IC Sockets (IC1, IC2): Insert the IC sockets into the board, making sure the orientation of the small notch matches the silkscreen outline. You can bend two diagonally opposite pins of the socket if you like, but setting the board with the socket inserted upside-down on a flat surface works just as well.

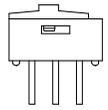


3. Capacitors (C1~C4): Insert the capacitors and solder them. The orientation doesn't matter. There are two different values:

Capacitor	Value	Code
C1, C2	50 pF	"50" or "500" ($50 \cdot 10^0$ pF)
C3, C4	100 nF	"104" ($10 \cdot 10^4$ pF = 100 000 pF = 100 nF)



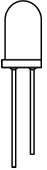
4. Slide switch (S1): Insert the switch to the intended location on the board and solder it. Orientation doesn't matter. Be careful when trimming the leads, the ends tend to fly away quite forcefully.



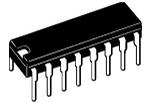
5. Battery Holder (BAT1): Make sure all solder joints are good under the battery holder before inserting it to the bottom side of the board and soldering it (also from the bottom side). It will only fit in one orientation. Use plenty of solder and make sure the solder has flowed all the way into the holes before removing the soldering iron.



6. LEDs (LED1~LED20): The orientation is important for the LEDs. Make sure the flat side of the LED (cathode) matches the silkscreen outline. The flat side of the LED also corresponds to the shorter lead. The LEDs are intended to be inserted from the top side of the board, but you can also insert them from the bottom side if you prefer. Don't solder too long on the LEDs, they will have reduced brightness if they become too hot during soldering.



7. ICs (IC1, IC2): Insert the two ICs into their corresponding sockets. You may have to bend the pins inward slightly before they will fit into the socket. Make sure the IC's notches match those of the sockets and the silkscreen outlines. Sometimes, the notch is replaced by a tiny dot near pin one, which should also face towards the notch of the socket.



8. Battery: Insert the CR2032 cell into the holder. With the marked side ("+" side) facing away from the board, slide the battery under the short metal tabs on the side of the holder marked "+", then press down on it until it clicks in. To remove the battery, insert a small flat screwdriver between it and the "-" contact of the holder, then carefully lever it out.



9. Turn it on! If your kit has a red switch, move it *away* from the "ON" position. If the switch is white, move it *towards* the "ON" position.

Questions? Problems? Comments? Ideas?
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